

Unit 4.5
Counting Principles
Day 4
Combinations

Combinations of n elements taken r at a time

If $\binom{n}{r}$ represents the number of combinations of n elements taken r at a time, with $r \leq n$, then

$${}_nC_r = C(n, r) = \binom{n}{r} = \frac{n!}{(n-r)!r!}$$

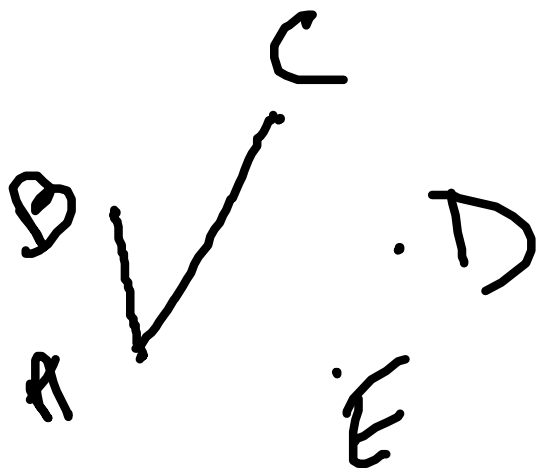
Show Combinations handout.

Notetaking Sheet Examples 1-4

$$\textcircled{1} \quad C(15,3) = \frac{15!}{(15-3)!3!} = \frac{\overset{5}{\cancel{15}} \cdot \overset{7}{\cancel{14}} \cdot \cancel{13} \cdot \cancel{12}!}{\cancel{3} \cdot \cancel{2} \cdot 1 \cdot \cancel{1}!}$$

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②



$$C(5,2) = \frac{5!}{3!2!}$$

③

$$C(12,4)$$

④

$$C(52,5) = \frac{52 \cdot 49 \cdot 48 \cdot 47 \cdot 46}{2 \cdot 1} = 2,598,960$$

Homework

Unit 4.5

Day 4